

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: James J. Finley et al.
Appl. No.: to be assigned
Filed: herewith
Title: DURABLE SPUTTERED METAL OXIDE COATING

Group Art Unit:
Examiner:

Docket No.: 1074D2

PRELIMINARY AMENDMENT

Commissioner for Patents
Washington, D.C. 20231

Sir:

Please amend the above-identified application as follows:

IN THE SPECIFICATION

After the title and before the paragraph entitled "BACKGROUND", insert the following paragraph:

Related Application

This is a divisional of U.S. Patent Application Serial No. 08/508,408, filed on July 28, 1995, now U.S. Patent No. 6,346,174 B1; which is a divisional of U.S. Patent Application Serial No. 08/151,229, filed on November 12, 1993, now abandoned.

IN THE CLAIMS

Cancel claims 1-20 and add the following claims 21-43.

--21. A coated product comprising a substrate and a film sputtered from a metal cathode target in an atmosphere comprising inert gas and reactive gas, the metal in the metal cathode target having a reactive gas switch point, wherein the concentration of the reactive gas during sputtering is below the reactive gas switch point such that the metal target is sputtered in a metallic mode to deposit a metal film having an amorphous structure defined as an amorphous metal film.

22. The product in accordance with claim 21, wherein the metal of the metal cathode target is selected from titanium, zirconium, tantalum, hafnium, niobium, vanadium and mixtures thereof.

23. The product in accordance with claim 22, wherein the metal of the metal cathode target is selected from titanium and zirconium.

24. The product in accordance with claim 23, wherein the metal of the metal cathode target is titanium.

25. The product in accordance with claim 21, wherein the metal film has a thickness ranging from 100 Å to 1500Å.

26. The product in accordance with claim 5, wherein the metal film has a thickness ranging from 200 Å to 700Å.

27. The product in accordance with claim 21, wherein the reactive gas is selected from oxygen, nitrogen and mixtures thereof.

28. The product in accordance with claim 27, wherein the reactive gas is oxygen.

29. The product in accordance with claim 27, wherein the inert gas is argon.

30. The product in accordance with claim 21, wherein the inert gas is argon.

31. The product in accordance with claim 30, wherein the reactive gas is oxygen.

32. The product in accordance with claim 31, wherein the substrate is glass, the metal in the metal film is titanium.

33. The product in accordance with claim 31, wherein the atmosphere comprises argon and up to 30 percent oxygen.

34. The product in accordance with claim 33, wherein the atmosphere comprises 2 to 15 percent oxygen.

35. The product in accordance with claim 21, wherein the substrate is glass.

36. The product in accordance with claim 21, wherein the metal film is thermally oxidized.

37. The product in accordance with claim 36, wherein the metal film is heated to at least 400°C.

38. The product in accordance with claim 36, further comprising a metal oxide film deposited on the metal film prior to thermal oxidation of the metal film.

39. The product in accordance with claim 38, wherein the metal oxide film has a thickness ranging from 40 Å to 120Å.

40. The product in accordance with claim 38, wherein the substrate is glass, the metal in each film is titanium, the density of the metal oxide film is 4 grams per cubic centimeter and the refractive index of the metal oxide film is 2.5

41. The product in accordance with claim 38, wherein the metal in each film is independently selected from titanium, zirconium, tantalum, hafnium, niobium, vanadium and mixtures thereof.

42. The product in accordance with claim 41, wherein the metal in each film is independently selected from titanium and zirconium.

43. A coated article comprising a glass substrate, a first titanium oxide film formed by thermally oxidizing an amorphous sputtered titanium metal film deposited from a titanium metal cathode target in an atmosphere comprising argon and oxygen below a reactive switch point of the titanium metal cathode target, and a second titanium oxide film deposited over the first titanium oxide film.--


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REMARKS

Claims 1-20 are canceled and claims 21-43 are added. Support for claims 21-43 is found, among other places, in the originally filed claims and in the drawing. Based on the foregoing, applicant respectfully requests admittance and consideration of claims 21-43.

Respectfully submitted,

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